

IN THE CLAIMS

A listing of all claims and their current status in accordance with 37 C.F.R. § 1.121(c) is provided below.

1. (Original) A method of monitoring a polyolefin production process, comprising:
placing a spectroscopic probe into a conduit of a polyolefin production system, having
conduit contents that comprise at least one of a feedstock, a feed stream, a reactor
discharge, a recovered component, a purified component, a polymer fluff, an
extruder feed, and a polymer pellet stream;
exposing the conduit contents to a radiation emission from the spectroscopic probe;
acquiring a spectroscopic signal in substantially real-time from the conduit contents in
response to the radiation emission via the spectroscopic probe;
analyzing the spectroscopic signal to determine at least one property of interest of a
component of the conduit contents.
2. (Original) The method as recited in claim 1, wherein the spectroscopic probe
comprises a Raman probe.
3. (Original) The method as recited in claim 1, wherein the feedstock comprises at
least one olefin monomer.

4. (Original) The method as recited in claim 1, wherein the feed stream comprises at least one of an olefin monomer, a comonomer, a chain transfer agent, a diluent, a catalyst, a co-catalyst, and an additive.

5. (Original) The method as recited in claim 1, wherein the reactor discharge comprises at least one of the polymer fluff, an olefin monomer, a comonomer, a catalyst, and a diluent.

6. (Original) The method as recited in claim 1, wherein at least one of the recovered component and the purified component comprise at least one of an olefin monomer, a comonomer, a catalyst, and a diluent.

7. (Original) The method as recited in claim 1, wherein the polymer fluff comprises a polymer fluff blend.

8. (Original) The method as recited in claim 1, wherein the polymer pellet stream comprises a mixture of polymer pellets.

9. (Original) The method as recited in claim 1, wherein the extruder feed comprises at least one of the polymer fluff, an additive, and a peroxide.

10. (Original) The method as recited in claim 1, wherein the property of interest comprises a chemical concentration of the component.

11. (Original) The method as recited in claim 1, wherein analyzing the spectroscopic signal comprises analyzing the spectroscopic signal using one or more chemometric models and the property of interest comprises a percent solids, a mechanical property, a chemical property, a rheological property, and a thermal property of the component.

12. (Original) The method as recited in claim 1, further comprising adjusting the composition of the conduit contents in response to the property of interest.

13. (Original) The method as recited in claim 1, further comprising adjusting the operation of at least one of a reactor feed system, polymerization reactor system, a monomer recovery system, an extruder feed system, and an extruder pelletizer in response to the property of interest.

14. (Original) The method as recited in claim 1, further comprising adjusting a product shipment in response to the property of interest.

15. – 28. (Cancelled)

29. (Original) A polyolefin production system, comprising:
a reactor feed system configured to receive one or more feedstocks via a first set of
conduits and to output one or more feedstreams via a second set of conduits;

a polymerization reactor system configured to receive the one or more feedstreams via the second set of conduits and to output a reactor discharge via a third set of conduits; a monomer recovery system configured to receive the reactor discharge via the third set of conduits and to output one or more recovered components via a fourth set of conduits and a polymer fluff via a fifth set of conduits; and one or more spectroscopic probes situated in at least one of the first, second, third, and fourth set conduits configured to acquire a spectroscopic signal in substantially real time.

30. (Original) The polyolefin production system as recited in claim 29, wherein the one or more spectroscopic probe comprise Raman probes.

31. (Original) The polyolefin production system as recited in claim 29, wherein the one or more feedstocks comprise at least one olefin monomer.

32. (Original) The polyolefin production system as recited in claim 29, wherein the one or more feedstreams comprise at least one of an olefin monomer, a comonomer, a chain transfer agent, a diluent, a catalyst, a co-catalyst, and an additive.

33. (Original) The polyolefin production system as recited in claim 29, wherein the reactor discharge comprises at least one of the polymer fluff, an olefin monomer, a comonomer, a catalyst, and a diluent.

34. (Original) The polyolefin production system as recited in claim 29, wherein the one or more recovered components comprise at least one of an olefin monomer, a comonomer, a catalyst, and a diluent.

35. (Original) The polyolefin production system as recited in claim 29, wherein the polymer fluff comprises a polymer fluff blend.